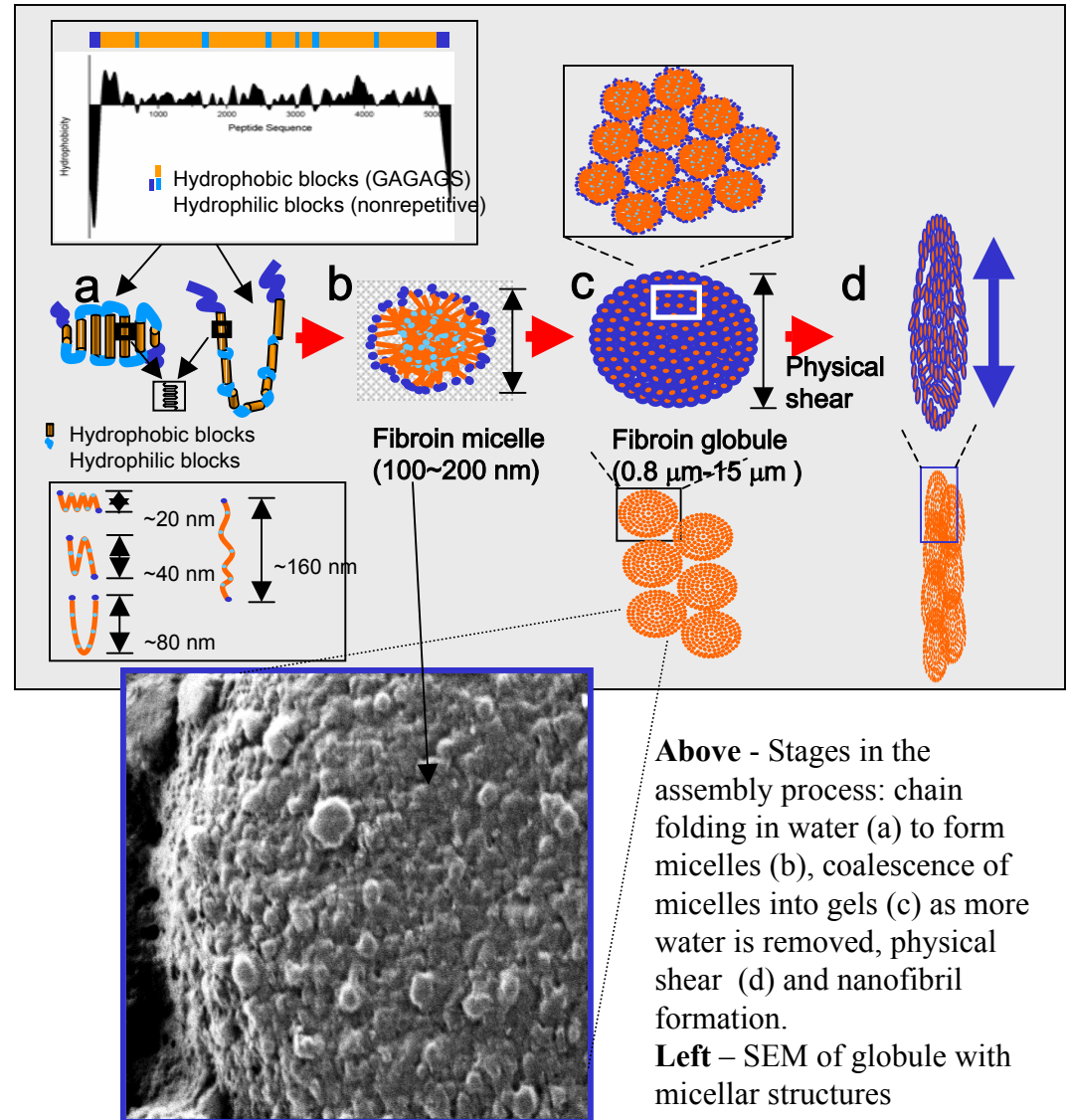


# Silk Protein Assembly – Control of Water

David Kaplan, Tufts University, DMR-0090384

Silk protein assembly results in fibers with an outstanding combination of strength and toughness. The mechanisms underlying this process are not clear and this insight is required if we are to mimic this process with natural or synthetic polymers. We have identified a critical role for control of water during the assembly process, matched by optimized domain chemistries in silks, that govern key steps in the aqueous processing - micellar assembly toward gel states with liquid crystal features prominent during the process. *Nature* 424:1057 (2003)



# Silk Protein Assembly – Control of Water

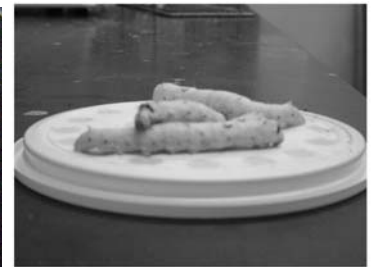
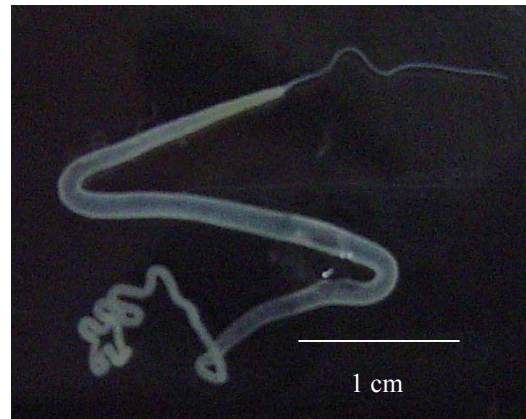
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## Education:

The insight into how silkworms and spiders form silk proteins into fibers for cocoon and orb web construction has been disseminated to a variety of outlets due to interest in these animals, their webs, green chemistry and related aspects of the topic. Specifically, stories are appearing in Weekly Reader, Science News, Scientific American, most news outlets, and many related venues for access by young adults to adults.

## Outreach:

Information on silkworms, silk spinning, spiders and the processes they use to spin fibers from water solutions is provided as part of the outreach through nontechnical publications.



**Top** – silkworm gland where silk is stored prior to spinning, **Right** – silkworms being reared for silk production